VIT

Vellore Institute of Technology

(Deemed to be University under section 3 of UGC Act, 1956)

REG.NO.: [redacted]

SLOT: C1+TC1+TCC1

SCHOOL OF ADVANCED SCIENCES

CONTINUOUS ASSESSMENT TEST - I

FALL SEMESTER 2025-2026

Programme Name & Branch	: BCB & SCOPE
Course Code and Course Name	: BAMAT100-FOUNDATIONS OF MATHEMATICS
Faculty Name(s)	: YOGALAKSHMI K
Class Number(s)	: VL2025260106350
Date of Examination	: 19.08.2025
Exam Duration	: 90 minutes

Maximum Marks: 50

General instruction(s):

- Answer All Questions

Q. No	Question	M	CO	BL
1.	If $A = \begin{bmatrix} 1 & 1 & 2 \\ 1 & 9 & 3 \\ 1 & 4 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 2 & 0 \\ 2 & 3 & -1 \\ 1 & -1 & 3 \end{bmatrix}$, verify that $(AB)^{-1} = B^{-1}A^{-1}$.	10	1	4
2.	a) If $A = \begin{bmatrix} \cos\alpha & \sin\alpha \\ -\sin\alpha & \cos\alpha \end{bmatrix}$, verify that $AA^T = I = A^T A$, where I is the unit matrix.	5	1	4
	b) Find the solution of the system of equations by using the matrix inversion method: $4x + 7y + 6z = 45;\ 2x + 5z = 30;\ 3x + y + 4z = 35$.	5	1	5
3.	Determine the rank of the following matrices: a) $\begin{bmatrix} 1 & 4 & 5 \\ 2 & 6 & 8 \\ 3 & 7 & 22 \end{bmatrix}$	3	1	5
	b) $\begin{bmatrix} 2 & 3 & -1 & -1 \\ 1 & -1 & -2 & -4 \\ 3 & 1 & 3 & -2 \\ 6 & 3 & 0 & -7 \end{bmatrix}$	7	1	5
4.	Solve the equations $x + 4y + 3z = 2,\ 2x - 6y + 6z = -3, 5x - 2y + 3z = -5$ by using Cramer's rule.	10	1	5
5.	Test for consistency the following equations and solve them if consistent: $x + y + z = 6;\ x + 2y + 3z = 14;\ x + 4y + 7z = 30$.	10	1	2